Seminar Advanced Topics in Semantics, Summer 2008
Session 3

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Design Considerations for ML-Style Module Systems

Small-group work

Discuss some or all of the following questions about Robert Harper and Benjamin Pierce's article "Design Considerations . . . "

a) Why is it necessary to (formally) distinguish between *internal* and *external names* of the components of a module?
b) In which sense do modules go beyond records?
c) There are two ways to define the *implements*-relation between a module and a signature. Explain the two approaches. What is the drawback when defining this relation in terms of principal signatures?
d) Explain the difference between *nominal* and *structural* signature matching.
e) Why is it necessary to distinguish module expressions from module values?
f) What, in the setting of the article, do *compilation* and *linking* refer to? What is the difference between *separate* and *incremental* compilation?
g) Explain the meaning of the terms *phase distinction*, and *first-class* and *second-class* modules.
h) Explain what *transparent*, *opaque* and *translucent* signatures are.
i) Give an example of how sealing affects type equivalence. (Think of type selection from a sealed module.)
j) Why is sealing not the same as existentially quantified types?
k) What is meant by *avoidance problem*?
l) What problems arise when cyclic module dependencies are allowed?

Discuss any further problems, or questions you find interesting about the chapter.